

University of Groningen

## Efficient electron injection from solution-processed cesium stearate interlayers in organic light-emitting diodes

Wetzelaer, G. A. H.; Najafi, A.; Kist, R. J. P.; Kuik, M.; Blom, P. W. M.

*Published in:*  
Applied Physics Letters

*DOI:*  
[10.1063/1.4790592](https://doi.org/10.1063/1.4790592)

**IMPORTANT NOTE:** You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

*Document Version*  
Publisher's PDF, also known as Version of record

*Publication date:*  
2013

[Link to publication in University of Groningen/UMCG research database](#)

### *Citation for published version (APA):*

Wetzelaer, G. A. H., Najafi, A., Kist, R. J. P., Kuik, M., & Blom, P. W. M. (2013). Efficient electron injection from solution-processed cesium stearate interlayers in organic light-emitting diodes. *Applied Physics Letters*, 102(5), 1-4. [053301]. <https://doi.org/10.1063/1.4790592>

### **Copyright**

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

### **Take-down policy**

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

## Supplementary Information

### Efficient electron injection from solution-processed cesium stearate interlayers in organic light-emitting diodes

G. A. H. Wetzelaer<sup>1,2</sup>, A. Najafi<sup>1</sup>, R. J. P. Kist<sup>1</sup>, M. Kuik<sup>1</sup>, and P. W. M. Blom<sup>1,3</sup>

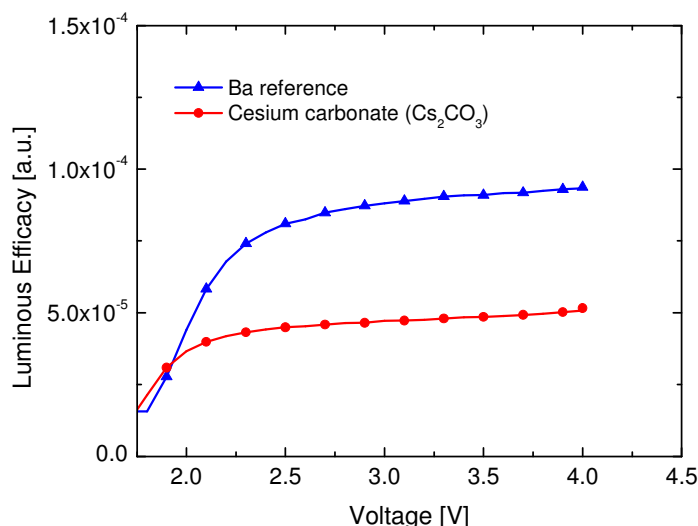
<sup>1</sup>*Molecular Electronics, Zernike Institute for Advanced Materials, University of Groningen, Nijenborgh 4, 9747 AG Groningen, The Netherlands*

<sup>2</sup>*Dutch Polymer Institute, P.O. Box 902, 5600 AX Eindhoven, The Netherlands*

<sup>3</sup>*Max Planck Institute for Polymer Research, Ackermannweg 10, 55128 Mainz, Germany*

#### Results for cesium carbonate interlayers

Figure S1 depicts the luminous efficacy as a function of voltage for poly[2-methoxy-5-(2'-ethylhexyloxy)-*p*-phenylenevinylene] (MEH-PPV) OLEDs comprising a barium and cesium carbonate cathode interlayer, respectively. Cesium carbonate was deposited from a 2-ethoxyethanol solution. The best  $\text{Cs}_2\text{CO}_3$ -based devices yielded an efficiency of approximately a factor of 2 lower than the corresponding barium-based control devices. It should be noted that the absolute efficacy values cannot be directly compared to the ones in the manuscript as a result of a different measurement setup.



**Fig. S1.** Luminous efficacy vs voltage characteristics of MEH-PPV OLEDs with Ba and  $\text{Cs}_2\text{CO}_3$  electron-injection layers.

Various attempts were made to use a  $\text{Cs}_2\text{CO}_3$  injection layer in blue-emitting PSF-TAD devices. Although a wide range of  $\text{Cs}_2\text{CO}_3$  concentrations (0.25-36 mg/mL in 2-ethoxyethanol) was

tested, as well as different solvents, the  $\text{Cs}_2\text{CO}_3$  interlayer could not significantly improve electron injection from the aluminum cathode. As a result, efficiencies of the PSF-TAD OLEDs were orders of magnitude lower than the barium reference devices.